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Observations on the Apparent Lek Behavior in Costa Rican Rainforest *Perrhybris pyrrha* Cramer (*Pieridae*).

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Abstract.—Large numbers of male *Perrhybris pyrrha* (Pieridae) butterflies briefly chase other species having the same tiger-striped color pattern as *P. pyrrha* females; showing that visual cues are important as a primary recognition system for those male butterflies when seeking a mate. The presence of abundant host-plant and adult food resources in a concentrated area could initiate a lek.

Introduction

A lek is a communal display or display area where males congregate for the purpose of attracting and courting females and to which females come to mate (Wilson 1975). Leks have been reported in mammals, fish, frogs, (Emlen and Oring 1977), birds (Lack 1968), and some insects (Dodson 1975, Campanella and Wolf 1974, Lloyd 1966). However they have not been described for any species of butterfly. Here I describe apparent lekking behavior in the males of the neptropical butterfly, *Perrhybris pyrrha* Cramer.

Observations

Observations on *Perrhybris pyrrha* were made at La Sirena, in the lowland rainforest of Parque Nacional Corcovado, (Osa Peninsula, Costa Rica), from 3 to 18 July and 1 to 6 August 1977. *P. pyrrha* is common on the Pacific side of Costa Rica and occurs in the forest from sea level to about 800 meters elevation. Females of *P. pyrrha* share the same basic tiger-striped color pattern and lazy flight behavior as many heliconiine and ithomiine butterflies (presumably being part of a mimetic complex), whereas males appear white in flight and act like more ordinary new world Pieridae such as *Phoebis*, *Ascia*, *Appias*, and *Leptophobia*.

Each morning at about 7 a.m., one and one half hours after sunrise, more than 100 *P. pyrrha* males were observed flying around a large vine-covered tree about 35 meters tall at the forest edge on the north side of the airstrip. Each male would fly from the crown of the tree to approximately 3 meters above the ground and then return to the top of the tree. None settled on the vegetation; all remained continuously in flight making the assemblage very conspicuous as far away as 100 meters. At the same time of day,

about 10 meters away from the tree, a small patch of *Lantana camara* L. (Verbenaceae) flowers was being visited by *Heliconius ismenius* Latr. (Heliconidae), *Mechanitis isthmia* Bates (Ithomiidae), *Anartia fatima* Fab. (Nymphalidae) as well as *P. pyrrha* females. From one to five males would leave the "display" tree and chase butterflies having the tiger-striped color pattern when they flew near the display. When *P. pyrrha* males chased *H. ismenius* or *M. isthmia*, the chase was short in duration (five to thirty seconds) and the males would return to the display. There were two types of chases of *P. pyrrha* females: On the one hand males chased the female for a short distance and then returned to the display, on the other the males chased the female out of sight, either into the forest or above the forest canopy. I did not observe the end of any of the long chases.

This activity of displaying and chasing continued until about 10 a.m., at which time both male and female *P. pyrrha* dispersed into the forest behind the display tree. This forest has a dense understory of *Capparis isthmensis* Eichl (Capparidaceae) trees, the host-plant of *P. pyrrha* (DeVries unpublished). In previous intermittant field observations during the course of one year, this has been the only habitat in Parque Corcovado where I have seen *P. pyrrha*. This possibly represents a restriction of the adults to the vicinity of the host-plant. Other forest habitats only 300 meters away have no *P. pyrrha* in them and the host-plant is rare in these forests. While in the forest butterflies do not form similar aggregations to my knowledge, nor have I seen them court. Rather, they are dispersed throughout the understory.

I observed these displays almost daily during the first half of July. On several days in early August, M. L. Higgins noted them as well. In November 1977 there was no evidence of display behavior, although eggs, larvae, and adults of *P. pyrrha* were abundant.

Discussion

I suspect that the two classes of chased *P. pyrrha* represented mated and virgin females, respectively. The length of time the males pursue females can be used as a measure of female receptivity in *Heliconius* (L. E. Gilbert, personal communication and my own observations), and in other butterfly genera (Scott 1974). Assuming the long chases end with mating and chases (short or long) are courtship displays, then the group display of *P. pyrrha* males described here would, in a broad sense, satisfy the definition of a lek. No spatial organization was discernable within the volumne of the display. Those males in the display closest to the ground at the time a female flew toward the *L. camara* patch could be in a better position to chase and court than those males that were at the top of the tree owing to the greater distance needed for the latter to travel to a passing female. Since differential mating success is the most important parameter in lek biology, further study is needed to determine if this exists among males of *P. pyrrha* at the display. The high host-plant density and the nearby nectar